CLAIMS:

1. An apparatus for the detection of fabric surface protrusions and the classification of fabric quality according to the geometrical parameters and population density thereof, said apparatus comprising:

(a) a conveyor mechanism for providing incremental movement of a fabric to be graded supported on said conveyor mechanism, said conveyor including a small-radius element over which successive portions of aid fabric are bent so that the silhouette of said surface protrusions may be viewed as a series of two dimensional images;

(b) a mechanism that intermittently drives said conveyor in a direction perpendicular to the axis of said small-radius element to expose successive bending lines and fabric surface,

(c) a fixed position image capture device focussed on said fabric surface and surface protrusions above the fabric surface and along each of said exposed successive bending lines, said device being actuated automatically when said conveyor is at rest between intermittent movements;

(d) lighting means for said silhouette of said surface and surface protrusions, said lighting means being arranged to provide a constant degree of illumination to said exposed successive bending lines;

(e) a processor arranged to receive data defining a set off successive two dimensional fabric images from said image capture device;

(f) a counting device operationally connected to said processor for recognizing said fabric surface, and surface protrusions and recording the number thereof;

(g) an automatic measuring device connected to said processor for recognizing said fabric surface and surface protrusions and calculating and recording the geometrical parameters of said protrusions; and

(h) a neural network arranged to receive outputs of said counter and said automatic measuring device and to calculate a numeric value corresponding to said geometrical parameters and number of said fabric surface protrusions, and to calculate and display a grade number relating said fabric being tested to corresponding industry grade standards.

2. The mechanism as claimed in claim 1, wherein said small-radius element is rotatable.

3. The mechanism as claimed in claim 1, further provided with a background screen positionable in view of said image capture device so

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that said image capture device sees said silhouette of said surface and surface protrusions against said background screen.

4. The mechanism as claimed in claim 3, wherein the color of said screen can be changed.

5. The mechanism as claimed in claim 3, wherein the opacity/translucency of said screen can be changed to enhance the contrast of said fabric as seen by said detection device.

6. The mechanism as claimed in claim 1, wherein said automatic measuring device connected to said processor for recognizing said fabric surface and surface protrusions can further calculate and record the three-dimensional volume of said protrusions, based on the set-off successive two dimensional fabric images.

7. An apparatus for the detection of fabric surface protrusions and the classification of fabric quality substantially as described hereinbefore and with reference to the accompanying drawings.

8. A method for the detection of fabric surface and surface protrusions and for the classification of fabric quality according to the geometrical parameters and population density thereof, said method comprising the steps
a. providing a sample of the textile to be classified;
b. bending said sample over a small diameter element;
c. generating a set-off two-dimensional image of the portion of the fabric sample being bent;
d. advancing said fabric sample by a small increment;
e. repeating steps c and d as often as necessary to scan said fabric sample;
f. counting the number of protrusions;
g. measuring and calculating the geometrical parameters of each protrusion;
h. calculating the degree or degrade of said protrusions by means of a neural network; and

9. A method for the classification of fabric quality as claimed in claim 8 wherein the protrusions are the result of pilling of a fabric surface.

10. A method for the classification of fabric quality as claimed in claim 8 wherein the protrusions are the result of snagging of a fabric surface.

11. A method for the classification of fabric quality as claimed in claim 8 wherein said protrusions are the result of hairiness of a fabric surface.

12. A method for the classification of fabric quality as claimed in claim 8 wherein the protrusions are the result of foreign bodies on a fabric surface.